On November 27th, after cold, damp weather, the temperature often being below 32° F. (for one week averaging 23° F.), cultures were taken for a third time, with negative results. A second group of three similar patches planted in August also gave negative results on November 27th. From January until June, at intervals of two weeks, the second group of patches received dilute organic solutions (beef-tea, etc.), which the first group did not. On June 3d and July 11th each of these patches so fed showed the presence of the bacillus typhosus, while the others did not. That no lateral extension of the growth took place was shown by negative results in culture taken from soil at distances of one, three, and nine feet from the patches. As to the effect of sunlight, it was shown that only organisms directly exposed were destroyed. Cultures at a depth of one-sixteenth of an inch were positive. The methods used for identifying the typhoid bacillus were those commonly used, including the serum reaction. The writer concludes that the typhoid bacillus is capable of growing rapidly in certain soils, and under suitable conditions may survive from one summer to another. He compares the patches which he fed artificially with organic solutions to soil which receives a large amount of organic material through defective drainage; and considers the nutrient material or natural culture medium thus afforded as the essential element in the continuance of the organism in the soil.

A New Form of Serum Reaction with Colon Bacillus and Proteus Bacillus.—Previous work has shown (PFANDLER, *Centralblatt für Bacteriologie,* January 19 and 28, 1898) that an agglutinating reaction may occur in colon infections, but that it is rare and poorly marked. The author investigated the serum reaction in eight cases of colon infection, of which six were cystitis where the colon bacillus was isolated from the urine, the seventh was an enteritis with a general colon infection, and the eighth was a general peritonitis from intestinal perforation, and the organism was obtained at the time of operation. A case of proteus infection giving the proteus bacillus in the urine and a case of enteritis giving the bacillus lactis aerogenes in the urine and stools complete the series. Rather large amounts of blood were drawn and the serum obtained by centrifugalization. Three loops of a twenty-four-hour culture of the organism upon agar were mixed in a tube of bouillon, and this suspension was mixed with the serum in proportions of 1 to 10, 1 to 30, 1 to 50, and 1 to 100. Hanging-drop preparations were made of each dilution upon a hollow slide. Serum-free controls were made for comparison. No reaction occurred after two hours, but on standing for twenty-four hours it was found that, while the control drops had not altered their appearance, except by multiplication of the bacilli, the serum mixture showed the bacilli as very fine threads which were coiled around each other, forming distinct balls. In the weaker dilutions the clumps were isolated from each other or connected by fine threads. Between these knots the fluid was quite free from organisms, and the cells and knots themselves showed no trace of motility. Individual bacilli or very small groups of these were rarely found and were surrounded by the labyrinth of threads. In the macroscopic preparations of serum and bouillon there occurred a gross reaction in which the uniform clouding was replaced by partial clearing of the medium. Inoculations of these clumps upon agar gave back the colon bacillus without change in its morphology. This reaction occurred only when the serum and the bacillus came from the same individual. A second essential for the reaction is that the patient should have a fever temperature. This is explained by the author by the asumption that a substance is formed in the body which will act upon the bacilli in the characteristic way only if the infection is intense, and the most common index of intensity is fever.

Immunity and Serotherapy against Yellow Fever.—SANARELLI (*Annales de l'Institut Pasteur*, October, 1897) says that most of the autopsies which he made in yellow fever were made shortly after death, and he often found the blood in the heart not coagulated, and collected the serum. The appearance of the serum varies: it may be transparent and clear, or slightly colored by blood or bile admixture. The yellowish serum may take a greenish tint by exposure to light. The serum of the cadaver produces the phenomena of agglutination on cultures of the bacillus icteroides, but the reaction is very variable. It has no inhibiting action against the organism. He obtained a considerable amount of serum from a convalescent eleven days after recovery, the man being still jaundiced. The serum was greenish, limpid, and transparent. It produced agglutination very slowly, and had a feeble inhibiting action against the organism when inoculated. Simultaneous injection of the serum with the virus was effective, but there was no effect when the serum was injected twenty-four hours before the inoculation. The organism is not destroyed in the serum, but remains alive for a long time. Other sera had no action. Antidiphtheritic serum and antityphic serum had no agglutinating action on the bacillus. Immunity against the disease is conferred in man by an attack. In experiments on the production of artificial immunity he gave up the use of rabbits, sheep, and goats on account of their sensitiveness to the organism. The immunity experiments were carried out on the guinea-pig, the dog, and the horse. The guinea-pig is difficult to immunize. He used for some weeks small doses of the filtered cultures or the pleural and peritoneal exudation of a goat killed by inoculation with the bacillus. After about one month of the treatment, and some days after the last injection, 0.1 c.c. of the virus was withstood. This quantity is absolutely fatal to the non-treated animal. During the treatments the weight of the animal reduces and by following the oscillation of this the treatment may be increased or diminished. Even with the greatest care these vaccinations produce a high mortality. In most cases it takes six or seven months before an animal is thoroughly immunized. The dog can be immunized much more rapidly than the guinea-pig. Immunity can be produced simply by injecting filtered cultures or cultures sterilized by ether. This proceeding produces infiltration and large purulent collections in the tissue. After this come the intravenous injections. The dogs are extremely sensitive to these injections; they vomit and have fever for several days. In seven or eight months they have an immunity against toxic doses of the bacillus. No matter how well vaccinated, the dogs are not proof against very large doses of the toxins. The beef stands subcutaneous injections better than the horse, but cannot stand the intravenous injections. The horse is given small doses (5 to 10 c.c.) of the filtered culture subcutaneously. These injections are followed by elevation of temperature,